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(54) **Virtual reality based rehabilitation apparatuses and methods**

(57) A method of measuring a user's range of motion, comprising: tracking user movement of at least one body portion using at least one sensor; correlating the tracked user movement to an avatar of the user in a virtual environment using at least one controller; displaying on an

output device the summation of tracked user movement graphically in the virtual environment such that user movement with respect to the user is represented in the virtual environment as avatar movement with respect to the avatar, in the same relative relationship.

EP 2 873 444 A3



EUROPEAN SEARCH REPORT

Application Number
EP 14 19 2613

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2009/027917 A1 (KONINKL PHILIPS ELECTRONICS NV [NL]; PHILIPS INTELLECTUAL PROPERTY [DE] 5 March 2009 (2009-03-05) * page 6, line 21 - page 8, line 34; figures 1-4 *	1,2,6,10	INV. A63B24/00 G06F19/00
X	EP 2 660 742 A1 (HOCOMA AG [CH]) 6 November 2013 (2013-11-06) * paragraph [0013] - paragraph [0063]; claims 6,7; figures 1-7 *	1,7,8	
			TECHNICAL FIELDS SEARCHED (IPC)
			A63B G06F A61B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 June 2015	Examiner Gartlan, Michael
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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Application Number

EP 14 19 2613

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

1, 2, 6-8, 10

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION **SHEET B**

Application Number

EP 14 19 2613

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1, 2, 6, 10

a database for storage of at least one of measured motion of at least one user, a virtual reality environment, a billing code, an exercise, a game, patient information, a report, and software to solve the problem of managing data from diverse sources.

2. claims: 3-5

at least one user interactive device to solve the problem of increasing the range of possible exercises.

3. claims: 7, 8

the controller processes measured user range of motion to display objects in a virtual reality environment to the user within the range of motion, near the limit of range of motion or outside the range of motion to solve the problem of improve the person's mobility in a challenging way.

4. claim: 9

the controller assesses user progress based on saved sensor data of the measured motion of the user to solve the problem of automating quantitative assessment.

5. claim: 11

the same type of coordinate system is used for the user and the avatar to solve the problem of simplifying the system.

6. claims: 12-14

the graphically displayed summation of tracked user movement is displayed relative to a reference point to solve the problem of positioning annotated feedback.

7. claim: 15

the graphic display of the summation of tracked user movement is a bubble where the bubble surface represents the limit of user movement comprise to solve the problem of displaying user-intuitive graphics.



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 14 19 2613

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 19 2613

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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09-06-2015

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		EP 2185071 A1	19-05-2010
		JP 2010536459 A	02-12-2010
		US 2011021317 A1	27-01-2011
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		WO 2013164364 A1	07-11-2013

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82